ISSN: 0976-3031

Available Online at http://www.recentscientific.com

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 8, Issue, 10, pp. 20923-20928, October, 2017

International Journal of Recent Scientific Research

DOI: 10.24327/IJRSR

Research Article

STUDY ON PREPARATION OF GUAVA JAM BLENDED WITH CARROT AND TULSI LEAVES

Madhuri Dahiwale[1] and Priyanka Dhurve[2]

[1]Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri (M.S) India
[2]National Institute of Food Technology Entrepreneurship and Management

DOI: http://dx.doi.org/10.24327/ijrsr.2017.0810.0985

ARTICLE INFO

Article History:

Received 15th July, 2017
Received in revised form 25th August, 2017
Accepted 23rd September, 2017
Published online 28th October, 2017

Key Words:

Blended Jam, Gauva, Carrot, Tulsi, Physiochemical properties. Ascorbic acid

ABSTRACT

Guava, Carrot and Tulsi leaves are used to preparation of jam. Jam is prepared from fruit pulp by boiling with sufficient quantity of sugar to a moderately thick consistency. There are different types of fruit jams like strawberry jam, mango jam, pineapple jam, apple and mixed fruit jam. Hence an attempt was made to find out the possibilities of mixing Guava, Carrot and Tulsi leaves for making jam and utilizing a major portion of marketable surplus of Guava. Guava, Carrot pulp and Tulsi leaves extract was blended in the ratio of 50:50:0 (T_1 Control), 55:45:5 (T_2), 45:50:5 (T_3) and 40:60:5 (T_4) respectively to prepare blended jam. The treatment of T_2, 55 gm guava pulp, 45 gm carrot pulp and 5 ml Tulsi leave extract, shows significantly less titratable acidity (1.05%), TSS (69..2ºBrix), total sugar (67.28%), moisture content (75.32%), pH (4.41), ascorbic acid (95.95mg), reducing sugar (4.70%), non reducing sugar (24.81%) and Total sugar (28.64%). Among the blended jam, the highest score for colour (9), flavor (9), consistency (8), taste (8) and overall acceptability (9) was judge in the treatment T2 (55 gm Guava pulp, 45 Carrot pulp and 5 ml Tulsi leaves extract). Treatment T_2, 55 gm guava pulp, 45 carrot pulp and 5 ml Tulsi leaves was more in red colour. It can be feasible at pilot level or commercial level.

INTRODUCTION

India is bestowed with varied agro climatic condition, so it can produce a wide variety of fruits and vegetables. It ranks seconds in fruits and vegetables production in the world, after China. (National Horticulture Database (NHD) published by National Horticulture Board, during 2012-2013). India produced 81,285 million metric tonnes of fruits and 162.19 million metric tonnes of vegetables.

Guava (*Psidium Guajava L*) fruit is one of the richest sources of vitamin C. It contains 4 to 10 times more vitamin C than some citrus fruits. The guava contains very little vitamin A or carotene. However, it is fairly rich in most other mineral nutrients. The pulp is rich in ascorbic acid, carotenoids, lycopene, β- phenolic compounds, flavonoids, essential oils, sesquiterpene alcohols and triterpenoid acids. These all compounds are related to many health effects of guava. Some authors have found high concentrations of carotenoids (beta-carotene, lycopene, and beta-cryptoxanthin), vitamin C and polyphenols in guava pulp. (Anthony, 2000).

The carrot (*Daucuscarota L*) belongs to the family Apiaceae. Carrot contains moisture content in between 86 to 89%. Chemically, carrot contains 0.2% fat, 0.9% protein, 1.1% total ash, 1.2% crude fibre, 2.2 mg/100 g Fe, 10.6% carbohydrate, 80 mg/100 g Ca, and 53 mg/ 100 g P (Bao and Chang, 1994). Carrots are particularly rich in carotene (provitamin A). Carrots are good source of fibre which is good for the health of digestive system. Among vegetables, carrots have greater amount of sugar, indicated by its sweetness (Lingappa and Naik, 1997). It is also a rich source of many vitamins like A, C, b-carotene, B1, B2 and B3 and minerals like calcium, potassium, phosphorus, sodium and iron. The red colour of carrot is due to lycopene which it contains. Dietary fibres are helpful in prevention of heart diseases and carrots are good source of dietary fibres, carotenoids and phenols compounds (Bao and Chang, 1994), that is why it helps in prevention of diabetes, cardiovascular disease and stroke (Scalbert and Williams, 2000).

Tulsi, scientific name (*Ocimum sanctum Linn*), is considered a holy plant. Two varieties of Tulsi found in india include black and green. Traditionally it is also considered to have medicinal properties mention in Atharveda and is also a component medicine of Ayurveda. It is member of mint or labiatae family from India. (Rajput, 2012). Tulsi is often enjoyed as a simple herbal tea and is frequently blended with other herbs and spices

Corresponding author:* **Madhuri Dahiwale
Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri (M.S) India

for various medicinal and culinary purposes. Medicines is from leaves, seeds and stems commonly used for cold, influenza, H_1N_1 (swine flu), hepatitis, bronchitis, stress cancer, headache, heart disease, malaria, digestive disorder. This is powerful anti-oxidant demonstrated as antifungal, antibacterial. Act as anti-inflammatory, immunomodulatory increases metabolism and lowering down stress hormones. It has strong immunomodulatory and Adoptogen to counter life style diseases in cancer, hypertension, diabetes and stress. (Ralph miller *et.al*, 2003).

The development of new products with high proportions of fruit in their formulations and good functional and nutritional properties contributes to the diversification of the market possibilities, especially if they are attractive, practical and have a long shelf life (Martín-Esparza, *et.al*. 2011). Jams are basically prepared from fruits and various sugars that are made considerable mainly by heat treatment. There are different types of fruit jam like strawberry jam, mango jam, pineapple jam, apple jam and mixed fruits jam. The demand of jam in the market is increasing day by day due to the changing lifestyle of the peoples. The jam is mostly used in the breakfast with bread. The jam is also preferred by the children with chapatti. So to aware the people regarding the nutritive value of the guava, carrot and tulsi leaves. The objectives were the developments of a jam blended with guava, carrot and tulsi leaves, the physical-chemical and sensory evaluation of this new product.

MATERIALS AND METHODS

Preparation of Jam

Healthy, mature and undamaged guava and carrot procured from local market of Chiplun, District Ratnagiri, Maharashtra. The ripened guava and carrot were cleaned to remove dirt. The cleaned guavas and carrots cut into small pieces with stainless steel knife and water was added at 300 mL/kg of fruit and boiled for about 25-30 min with continuous stirring separately. The pulp was extracted from above procedure. The total soluble solid (TSS) of the guava pulp was in the range of 10.5-10.9 ^{o}Brix. These pulps were used for preparation of jam. Tulsi leaves extract was extracted by washing and grinded in the mixer grinder. Guava, carrot and tulsi leaves pulp was blended in the ratio of 50:50:0, 45:55:5, 55:45:5 and 60:405:5 respectively (Table 1) to prepare the jams by addition of desired quantities of sugar, citric acid and pectin.

Table 1 Experimental design for preparation of jam

Treatment	Guava pulp (%)	Carrot pulp (%)	Tulsi extract (ml)
T1 (Control)	50	50	0
T2	55	45	5
T3	45	55	5
T4	40	60	5

Determination of Physical and Chemical Properties Of Jam

The moisture content was determined by using air oven method. CIE-$L^*a^*b^*$ colour coordinates (10° observer and D65 illuminant) were obtained using tintometer (Lovibond, PFX195, UK). The L^*, a^*, and b^* values indicate lightness/darkness, greenness/ redness, and yellowness/ blueness, respectively (Renuka, *et al*. 2010). The pH value of the sample was measured with a digital glass electrode pH meter (CD 175 E) at room temperature, which was calibrated prior to sample pH measurement using buffer solutions of pH value 4.0 and 7.0 (Ranganna, 1989). The method of Lane and Eynon was used for determination of sugars (total sugars, reducing sugar and non-reducing sugar) was described by (Ranganna, 1989). Total soluble solid of blended jam was determined by digital refractometer. It should not be less than 68ºBrix.Titrable acidity: took one g blended jam and dissolve it in 20 mL distilled water, add two to three drops of phenoptheline indicator then titrate it with 0.1 N NaOH till pink colour appears. Titrable acidity can be calculated as in Equation.

$$\text{Ta}\ (\%) = \frac{0.685 \times 0.1 \times B}{W} \times 100$$

Where, Ta is titrable acidity, B is the reading of burrete and W is the weight of sample.

Ascorbic acid: Ascorbic acid is an important constituent of fruits and vegetables. It is a reducing agent, and is determined by its reaction with 2, 6- dichlorophenol indophenol. The dye which is blue in alkaline solution and red in the acidic solution is reduced to colourless form. Took 10-20 mL of fruit juice or 10 g of solid food and blend it with 3% HPO3 to make the total volume of 100 mL, filter or centrifuge this material. The ascorbic acid can be calculated as Equation (4).

$$A_a = \frac{T_r \times D_f \times V_m \times V_s}{V_e \times W_t} \times 100$$

where, Aa is ascorbic acid; Tr is titer; Df is dye factor; Vm is volume of solution made; Vs is volume of sample; Ve is volume of extract; Wt is weight of sample taken. Ascorbic acid is an important constituent of fruits and vegetables. Ascorbic acid was determined by micro kjeldhal method.

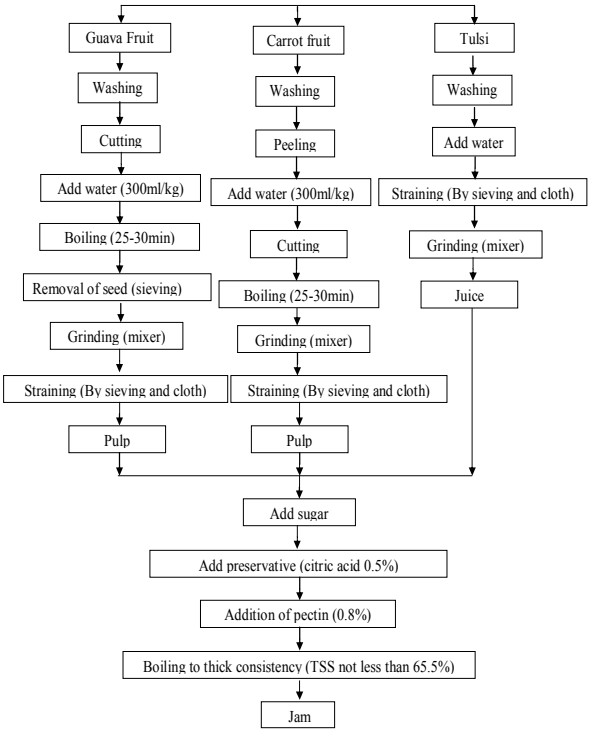

Figure 1 Flow chart for preparation of Gauva jam blended with Carrot and Tulsi extract

Sensory Evaluation

Sensory characteristics of the product of different treatment such as general appearance, texture, taste, flavor were evaluated by panel of judges using nine point Hedonic scale [IS:6273-part2 (1971)].

The sensory evaluation was carried out for colour, taste, appearance and over all acceptability. Samples of the guava jam blended with carrot and tulsi leaves were served for the evaluation of above parameters to twenty panelists. The score sheet was provided with product and panelists were requested to mark the product score according to their liking. Based on the individual marking the average score was computed.

The analysis of variance with Graph Prism Pad 6 was used for this evaluation.

RESULT AND DISCUSSION

Colour

One of the most important parameters to which consumers are sensitive when selecting foods is the colour. The Tintometer was used to record the colour parameters of jam samples. The units within the L*, a*, b* system give equal perception of the colour difference to a human observer. The average L*, a*, b* values of jam samples are presented in Table 2. The values of L*, a*and b* varies from 63.65 to 65.78, 5.39 to 5.89 and 15.77 to 21.62 respectively. The a* and b* of T2 was maximum might be due to high amount of Gauva pulp and incorporation of Tulsi extract.

Table 2 Effect of colour parameter on Guava jam blended with Carrot and Tulsi

Treatment	Colour		
	L*	a*	b*
T1	63.65±0.50	5.39±0.76	18.84±0.65
T2	65.47^{c}±0.45	5.89^{c}±0.21	21.62^{c}±0.58
T3	65.78^{b}±0.34	5.77^{b}±0.56	15.77^{b}±0.62
T4	63.82^{a}±0.64	5.45^{a}±0.27	19.64^{a}±0.71

Moisture Content

The moisture content of guava jam blended with carrot and tulsi leaves was determined. Three replications were taken and the data is given in the Table 2. The value of mean Moisture content was found maximum in T_4. T_4 was having maximum moisture content as compare to T_1, T_2 and T_3 because of high ratio of fruit composition taken in the jam. The value of Moisture content was found minimum in T_2.

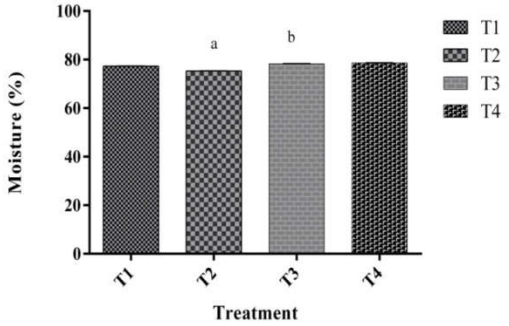

Figure 2 Moisture content of blended jam of guava, carrot and tulsi extract. Values are expressed in mean ± SD (n=3) ($p \leq 0.05$). a, b and c represent significant difference between T1×T2, T1×T3 and T1×T4 of the jam sample

The amount of moisture content in T_2 and T_3 was less than T_1 and T_4. The high moisture content of jam (equivalent to an equilibrium relative humidity of about 82%) makes it susceptible to mould damage once the receptacle has been opened and exposed from some time to the air. No problems of microbiological spoilage are likely to arise in the canned product during storage.

pH

The pH was found to be in the range of 4.03 to 4.91 i.e. acidic in nature. The results were represented in Table 2. The range of the pH value for T_3 was 4.91. Patil *et. al*. (2013) and Correa *et al*. 2011 resulted the pH value of guava jam blend with sapota was 4.97 and 4.03 respectively. Jam is acidic in nature because of Ascorbic acid present in the fruits and citric acid used to prevent jam from microbial growth. Acidity of the fruit or its pH value is one of the most important factors in jam process which should be monitored and controlled. The pH of the fruit sample is very important, as it helps in the formation of optimum gel in the preparation of jam. Indeed, acidity is an imperative fact influencing pectin gelation, texture and overall quality of fruit jams (Garrido, Lozano, & Genovese, 2015).

Reducing sugar and Non-reducing sugar

The results of reducing sugar and non reducing sugar were represented in table 2. The range of pH value of reducing sugar and non reducing sugar was 4.70% to 14.00% and 22.20 to 60.82. Reducing sugar means the amount of sugar present in the fruit pulp which we used for preparation of jam. The similar results are obtained by Patil MM *et al*., (2013) in guava jam blended with sapota.

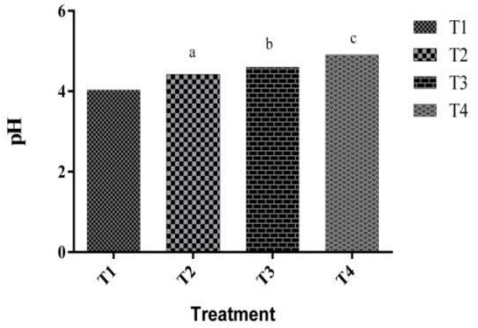

Figure 3 pH of blended jam of guava, carrot and tulsi extract. Values are expressed in mean ± SD (n=3) ($p \leq 0.05$). a, b and c represent significant difference between T1×T2, T1×T3 and T1×T4 of the jam sample

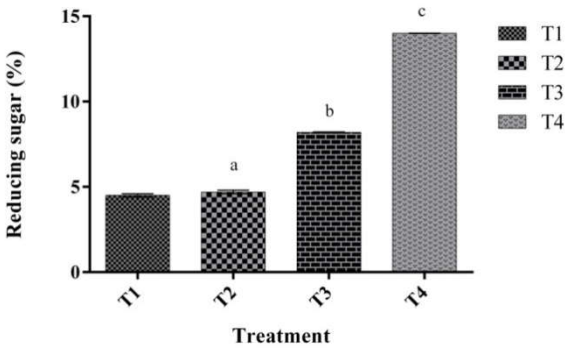

Figure 4 Reducing sugar of blended jam of guava, carrot and tulsi extract. Values are expressed in mean ± SD (n=3) ($p \leq 0.05$). a, b and c represent significant difference between T1×T2, T1×T3 and T1×T4 of the jam sample

The Non-reducing sugar for T_4 was 60.82%. The increase in reducing sugar is caused by conversion of sucrose to glucose and fructose, due to temperature and acidic condition (Shah *et al*., (2015); Singh *et al*., (1999))

Total sugar

The total sugar was obtained in the range from 26.81 to 67.28 The maximum percentage of total sugar was found in T_4 and minimum percentage of found in T1. Total sugar means the total amount of sugar present in the jam. The increase in total sugar is mainly due to the hydrolysis of starch. The increase in reducing sugar might be due to the inversion of non reducing sugar to reducing sugar during storage. The inversion of non reducing sugar was due to the presence of acid along with high temperature that speed up the inversion process (Shermat *et. al*. 2017). Similar results were also obtained by Iboyaima Singh *et al*. (2000), Richard *et al*. (1963), and Rajanala *et al*. (1995), while working on the enzymatic liquefaction of mango, grapes and banana fruits respectively. They have observed a significant increase in total sugar and reducing sugar content of grape juice and banana juice prepared using pectinolytic enzymes, and our results are also in agreement with these findings.

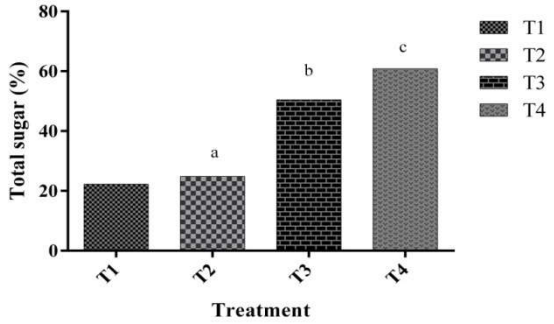

Figure 5 Total sugar of blended jam of guava, carrot and tulsi extract. Values are expressed in mean ± SD (n=3) ($p \leq 0.05$). a, b and c represent significant difference between T1×T2, T1×T3 and T1×T4 of the jam sample

Titratable acidity

The data for titratable acidity is given in Table 2. The range of titratable acidity was 1.33 to 1.03. T_4 had maximum amount of titratable acidity than T1, T2and T3 which may be due to the enzymatic de-esterification and degradation of pectin resulting in an increase of total acid and hence, decrease in pH values.

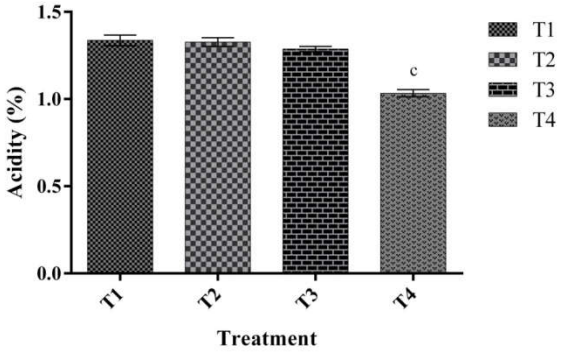

Figure 6 Titratable acidity of blended jam of guava, carrot and tulsi extract. Values are expressed in mean ± SD (n=3) ($p \leq 0.05$). a, b and c represent significant difference between T1×T2, T1×T3 and T1×T4 of the jam sample

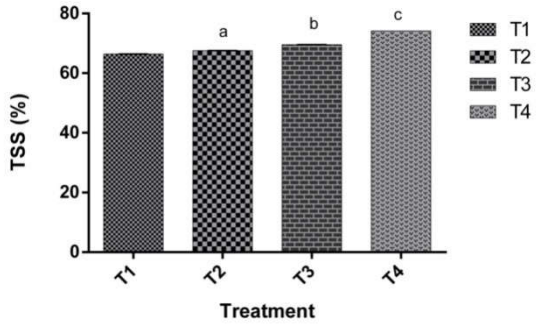

Figure 7 Total soluble solid of blended jam of Guava, Carrot and Tulsi extract. Values are expressed in mean ± SD (n=3) ($p \leq 0.05$). a, b and c represent significant difference between T1×T2, T1×T3 and T1×T4 of the jam sample

Total soluble solid (TSS)

The data is represented in Table 2. The range of TSS found in guava jam blended with carrot and tulsi was 66.4 to 74.2%. The TSS present in the T2 is maximum than T1, T3 and T4. The increase TSS in T2 might be due to the degradation of polysaccharide in the presence of acid. Also most of the solid become soluble slowly due to which the TSS increased gradually. Similarly, Khan *et al*. (2012) also observed an increase in TSS from 66.5 to 68.8 0 brix in fruit jam. Ehsan *et al*. (2003) and Ehsan *et al*. (2002) also found an increase in TSS (70 to 70.8 0 brix) in watermelon and lemon jam.

Ascorbic Acid

The range of Ascorbic Acid found in Guava jam blended with Carrot and Tulsi was 51.10 to 95.95%. Guava and Tulsi is rich in ascorbic acid and for preparation of jam guava was used so it is necessary to find out the ascorbic acid.T_1 having minimum amount of ascorbic acid as compare to T_2, T_3 and T_4. T_2 having maximum amount of ascorbic acid because it contain high amoumt of Gauva pulp and Tulsi extract which. T_1 having manimum amount of ascorbic acid. Similar finding obtained by Baliji *et al*. 2012 studied on aonla jam blended with herbs. They found that 100.1 mg/100g ascorbic acid in Aonala jam blended with tulsi herb. Ascorbic acid is the most important nutrient that represents the quality characteristics of the product, which is substantially affected due to oxidation during processing and storage (Veltman *et al*., 2000).

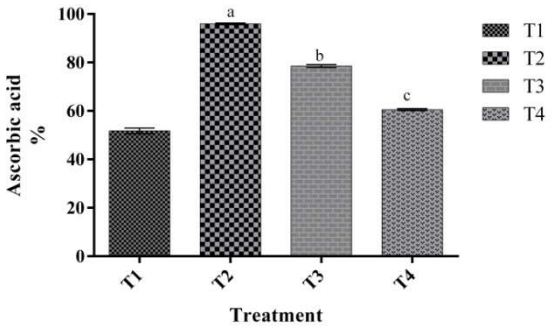

Figure 7 Ascorbic acid of blended jam of guava, carrot and tulsi extract. Values are expressed in mean ± SD (n=3) ($p \leq 0.05$). a, b and c represent significant difference between T1×T2, T1×T3 and T1×T4 of the jam sample

Sensory Evaluation

Sensory evaluation is important tool in food industry sensory evaluation is scientific discipline used to evoke measure, analyze and interpret reaction to those characteristics of food

Table 3 Effect of physiochemical parameters on Guava jam blended with Carrot and Tulsi

Sr. No.	Parameters	Chemical analysis			
		T1	T2	T3	T4
1.	Moisture content (db)	77.31±0.21	75.32±0.43	78.32±0.41	78.64±0.56
2.	pH value	4.03±0.55	4.41±0.67	4.60±0.71	4.91±0.2
3.	Reducing sugar, %	4.50±0.6	4.70±0.45	8.19±0.23	14.00±0.65
4.	Non-reducing sugar,%	22.20±0.51	24.81±0.63	50.41±0.39	60.82±0.72
5.	Total sugar,%	26.81±0.71	28.64±0.45	44.20±0.48	67.28±0.41
6.	Titrable acidity,%	1.33±0.2	1.32±0.27	1.28±0.59	1.03±0.68
7.	Total Soluble Solid,˚Brix	66.40±0.44	69.20±0.37	69.50±0.61	74.50±0.25
8.	Ascorbic acid, mg/100g	51.10±0.42	95.95±0.29	78.54±0.21	60.54±0.45

perceived through the sense of sight, smell, touch and taste. The panel of 20 semi trained judges were given the Guava jam blended with carrot and tulsi leaves samples for evolution of organoleptic characteristic viz appearance, colour, taste, flavor, and overall acceptability. The mean score for sensory evaluations presented in appendices K. It showed that the sensory score of all sample was in acceptable range.

The data of sensory evaluations in the appendix K show that addition of fruits, sugar and citric acid shows improvement in appearance, colour, taste, flavor. The composition of maximum quantity of fruits, sugar and citric acid in T_2 with respect to T_1, T_3 and T_4 got highest score in colour (8). The sample T3 had lower score (6) as compared to T_1 and T_2, this was because the T_3 had less quantity of fruits, sugar and citric acid as compared to other. The colour of sample varied from faint red to dark red. The darker colour was due to higher number Sugar and citric acid.

Taste is primary factor which determines the acceptability of any product which has the highest impact as for as market success of product is concerned, the score for taste had also been valid with the increase in composition of fruits, citric acid and sugar. The sample having highest quantity of fruits, sugar and citric acid T_2 was rated highest (9) in taste while the T_4 was rated (8), T_3 was rated (7) and T_1 was rated (6) respectively. The score for flavor increased with increase in composition.

The sample T_2 was rated highest for flavour (9) because of higher consistency than the other sample T_1, T_3 and T_4. The T_2 had highest score for overall acceptability (9) and decreased with decrease in composition.

CONCLUSION

From the present study it is concluded that th T4 (55% Gauva pulp, 45% Carrot pulp and 5ml of Tulsi Extract) has overall acceptace with references of chemical analysis, colour analysis and sensory evaluation. The jam prepared from Gauva, Carrot and Tulsi Extract has pH value 4.41 which is optimum for gel formation in Jam and ascorbic acid is 95.95 mg/ 100gm which is good supplement of Vitamin C. The jam has Total soluble solid 69.20 ˚Brix which is acceptable as per FPO recommendation TSS should be 68.00˚Brix. More stable red colour obtained during colour analysis and sensory evaluation. It is possible from our finding that the new product can be feasible even at commercial level.

References

Anthony C. D. (2000). A review of Guava (PsidiumGuajava). Dweck data.

BAO, B., and CHANG, K.C. (1994): Carrot Pulp Chemical Composition, Color, and Water-holding Capacity as Affected by Blanching. *J. Food Science*.,59(6):1159-1161.

Bergamasco R., and Vieira, A. M. S.(2011). Physico-Chemical and Sensorial Evaluation of Guava Jam Made without Added Sugar. Chemical Engineering Transactions 24:505-510

Chaturvedi, A., Sujatha, V., Ramesh, C., and Babu, D.J. (2013). Development of shelf stable intermediate moisture carrot shreds using radiation as hurdle technology. *International Journal of Food Research*, 20: 775-781.

Correa R. C. G., Sora G. T.S., Haminiuk C.I.W. , Ambrosio-Ugri M.C.B. ,Ehsan, E.B., Naeem, Z.P., Ghafoor, A., and Bahtti, M.S. (2002). Development, standardization and storage studies on watermelon lemon jam. *Pakistan Journal of Food Science*, 12: 21-24.

Ehsan, E.B., Naeem, Z.P., Javid, A., and Nazir, A. (2003). Development, standardization and storage studies on grape fruit apple marmalade. *Pakistan Journal of Food Science*, 13: 11-15.

Er. Patil M. M., Er. S. B. Kalse, and Er. A. A. Sawant. (2013). Preparation of guava jam blended with sapota. Agric Eng Int: CIGR Journal, 15(1): 167-72.

Garrido, J.I. , Lozano, J.E. and Genovese, D.B. (2015). Effect of formulation variables on rheology, texture, colour, and acceptability of apple jelly: Modelling and optimization. *Journal of Texture Studies*, 41:594-610

Khan, R.U., Afridi, S.R., Ilyas, M.M., Sohail,and A.H. (2012). Development of strawberry jam and its quality evaluation during storage. *Pakistan Journal of Biochemistry and Molecular Biology*, 45: 23-25.

Lingappa, K. and Naik, C (1997). Wine preparation from Carrot (Daucus Carotia L.). Indian Food Packer., 51:10-13.

Martín-Esparza, M.E., Escriche, I., Penagos, L. and Matínez-Navarrete, N. (2011) Quality Stability Assessment of a Strawberry-Gel Product during Storage. Journal of Food Process Engineering. 34:204-223.

Martín-Esparza, M.E., Escriche, I., Penagos, L. and Matínez-Navarrete, N. (2011). Significance of Osmotic Temperature Treatment and Storage Time on Physical and Chemical Properties of a Strawberry-Gel Product. *Journal of Science and Food Agriculture*. 91:894-904.

Ralph M. and Miller S. (2003). Tulsi queen of herbs India Holy Basil. The Queen lsle enterprise 1405 alfair lane, salt spring island, BC 250-653-4507.

Rangana, S.S. (1986). Handbook of analysis and quality control for fruit and vegetable products. Tata Mc Graw Hill Pub. Co. Ltd., NEW DELHI, INDIA.

Renuka, B. Prakash, M. and Prapulla S.G. (2010). Fructooligosaccharides based low calorie gulab jamun: Studies on the texture, microstructure and sensory attributes. LWT Food Science and Technology, 62:325-332

Scalbert A., and Williamson G. (2000). Dietary intake and bioavailability of polyphenols. J. Nutr., 130: 2073–2085.

Shah, W., Arsalan, K., Alam, Z., Muhammad, A.K., Falak, N.S., Noor, U.A., Muhammd, A., Said, W., Ali, M.,and Sher, H.K. (2015). Quality evaluation and preparation of apple and olive fruit blended jam. *Global Journal Medical Research: L Nutrition and Food Science*, 15: 15-21.

Singh, S., Shivhare, U.S., Ahmed, J.,and Raghavan, G.S.V. (1999). Osmotic concentration kinetics and quality of carrot preserve. Food Research International, 32: 509-514.

Vikram Balaji, Bihari Man, Narayan Surya and Prasad, V.M. (2012). Effect of dried powder of herbals addition on aonla jam with granulated particles of coconut. *Internat. J. Proc. & Post Harvest Technol.,* 3 (2): 188-193.

How to cite this article:

Madhuri Dahiwale and Priyanka Dhurve.2017, Study on Preparation of Guava Jam Blended With Carrot And Tulsi Leaves. *Int J Recent Sci Res.* 8(10), pp. 20923-20928. DOI: http://dx.doi.org/10.24327/ijrsr.2017.0810.0985

****